

# Brandon Leung

✉ b7leung@ucsd.edu | 📞 (949) 394-8599  
🌐 [b7leung.github.io](https://b7leung.github.io) | 🌍 Citizenship: United States

## EDUCATION

### University of California, San Diego (UCSD)

Sep. 2015 – Feb. 2022 (Expected)

- **Current M.S. student in Machine Learning & Data Science**, expected graduation February 2022. GPA 3.86/4.
- **B.Sc. in Computer Science**, graduated August 2019. GPA 3.88/4 (Magna Cum Laude, with highest distinction).

*Relevant coursework:* Statistical Machine Learning, Computer Vision, Probability & Statistics, Linear Algebra, Recommender Systems, Robotics Planning/Learning/Sensing, Algorithm Analysis/Design, Operating Systems, Computer Networking, Computer Security, Theory of Computation, Computer Architecture.

## RESEARCH INTERESTS & EXPERIENCE

- **2D Computer Vision** (recognition, detection, semantic segmentation).
- **3D Computer Vision** (recognition, detection, single view reconstruction, 3D completion).
- **Deep Learning** (unsupervised learning, adversarial attacks, continual learning, long-tailed learning, robustness, network distillation).
- **Transfer Learning** (low-shot learning, meta learning, transfer learning, domain adaptation).
- **NLP** (sentiment analysis, clustering, style transfer, generative modeling).
- **Statistics/Data Science** (Bayesian & Frequentist statistical modeling, regression models, hypothesis testing).

## SIGNIFICANT PROJECTS

### Drone Flight Dataset for Neural Network Classification Robustness [\[details\]](#)

Sep. 2018 – Present

- Project leader & main developer of a novel drone flight system, recruiting 13 to collect a 120,000 image dataset.
- Published to CVPR; conducted experiments showing neural network vulnerabilities to pose & camera shake which we improve by 32%. Extensively used Python, PyTorch, OpenCV, and ROS in an Ubuntu environment.

### Refining Single View 3D Reconstructions with Self-Supervised Machine Learning [\[details\]](#)

Jan. 2021 – Present

- Developed a novel neural network refinement algorithm to generate 3D meshes from a single image.
- Used self-supervised learning & symmetry regularization; beats state-of-the-art (up to 47%), across many datasets.

### Self-Driving Cars using 2D/3D Action and Explanation Prediction [\[details\]](#)

Feb. 2021 – Present

- Guided formulation & development of a model fusing 2D images & 3D pointclouds for self-driving car navigation.
- 2D & 3D explanations from Faster R-CNN & MVX-Net are jointly predicted with actions, justifying model decisions.
- Annotated new action & explanation annotations labels from Amazon Turk to add to the Waymo Open dataset.

### Statistical Linguistic Analysis for User Chat Message Logs [\[details\]](#)

Feb. 2021 – Jul. 2021

- Built an interactive dashboard to analyze user chat logs and describe their linguistic behavior.
- Applied NLP transformer models (RoBERTa, GPT-2) to sentiment analysis, clustering, style transfer, & generation.
- Used Jupyter Notebooks & Voilà. Tested with pytest; documented with Sphinx. Deployed using AWS (EC2 and S3).

### Domain Adaptation for Real-World Single View 3D Reconstruction [\[details\]](#)

Jun. 2020 – Dec. 2020

- Studied the application of several domain adaptation methods (MMD, Deep CORAL, DANN) to 3D reconstruction.
- Proposed a new architecture, involving multitask learning with domain adversarial learning.

### Review and Unification of Unsupervised Domain Adaptation [\[details\]](#)

Jul. 2020 – Nov. 2020

- Formulated a unified taxonomy to generalize methods in the unsupervised domain adaptation literature.
- Critically analyzed Contrastive Adaptation Networks, indicating areas of modification to improve it.

### Connect Four AI Using Reinforcement Learning [\[details\]](#)

Mar. 2020 – Jun. 2020

- Developed an AI to play Connect Four, using Q-Learning and Monte-Carlo policy iteration.
- Formally described the game as a Markov decision process; generated episodes using self-play.

## SELECTED PUBLICATIONS

- Leung, B.\*, Ho, C. H.\*, Sandstrom, E., Chang, Y., & Vasconcelos, N. (2019). *Catastrophic child's play: Easy to perform, hard to defend adversarial attacks*. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).
- Leung, B., et al. (2021). *Black-box test-time shape refinement for single view 3d reconstruction*. [ArXiv:2108.09911](https://arxiv.org/abs/2108.09911), MS Thesis in progress
- Leung, B., Singh, S., & Horodniceanu, A. (2020). *Domain adaptation for real-world single view 3d reconstruction*. [ArXiv:2108.10972](https://arxiv.org/abs/2108.10972)
- Leung, B., Ho, C. H., Persekian, A., Orozco, D., Chang, Y., Sandstrom, E., Liu, B., & Vasconcelos, N. (2019). *Oowl500: Overcoming dataset collection bias in the wild*. [ArXiv:2108.10992](https://arxiv.org/abs/2108.10992)

## PROFESSIONAL EXPERIENCE

<b>Graduate Student Researcher</b>	<b>Statistical Visual Computing Lab, UCSD</b>	<b>Jun. 2017 – Present</b>
<ul style="list-style-type: none"><li>Researching machine learning &amp; computer vision under Prof. Nuno Vasconcelos, with a focus in 2D/3D detection, domain adaptation, GANs, 3D reconstruction, self-supervised learning, and explainable neural networks.</li></ul>		
<b>Software Engineer, Intern</b>	<b>Himax Imaging</b>	<b>Summers 2015 &amp; 2016</b>
<ul style="list-style-type: none"><li>Developed internal quality control programs in Java for a R&amp;D/fabrication company specializing in CMOS image sensors used in smartphone cameras and car backup cameras.</li></ul>		

## AWARDS

- NSF Graduate Research Fellowship**, Mar. 2020.
- Sloan Foundation Graduate Fellowship**, Sep. 2019.
- STARS Graduate Fellowship**, Sep. 2019.
- UCSD ECE Departmental Graduate Fellowship**, Sep. 2019.
- UCSD Undergraduate Research Award**, awarded to 2 graduating UCSD ECE students each year, May 2019.
- Qualcomm Alumni Scholarship**, Sep. 2018.
- NSF REU Research Grant**, Sep. 2018.
- Phi Beta Kappa Academic Honor Society Inductee**, Jun. 2018.
- Ledell Research Scholarship** for Science and Engineering, Jun. 2018.
- Caledonian Honor Society Inductee**, Muir College at UCSD, May 2018.
- University of California LEADS Scholarship**, Apr. 2017.

## TEACHING EXPERIENCE

<b>TA, Data Science Theoretical Foundations II</b>	<b>UCSD</b>	<b>Fall Quarter 2018</b>
<ul style="list-style-type: none"><li>DSC 40A, with Professor Janine Tiefenbruck.</li></ul>		
<b>TA, Data Science Theoretical Foundations II</b>	<b>UCSD</b>	<b>Spring Quarter 2018</b>
<ul style="list-style-type: none"><li>DSC 40B, with Professor Janine Tiefenbruck.</li></ul>		
<b>TA, Introduction to Programming Java</b>	<b>UCSD</b>	<b>Winter Quarter 2018</b>
<ul style="list-style-type: none"><li>CSE 8A, with Professor Christine Alvarado.</li></ul>		

## ADDITIONAL EXPERIENCE

<b>IT Technician</b>	<b>UCSD</b>	<b>Aug. 2016 – Feb. 2017</b>
<ul style="list-style-type: none"><li>Provided tier 1 networking, software, and hardware IT support for the over 35,000 students and staff at UCSD.</li></ul>		
<b>RMA Technician</b>	<b>Alpha Networks</b>	<b>Summer 2014</b>
<ul style="list-style-type: none"><li>Troubleshoot and repaired routers, modems, switches, and other networking components at Alpha Network's RMA division.</li></ul>		

## OUTREACH & MENTORSHIP

<b>SRIP Research Mentor</b>	<b>UCSD</b>	<b>Summers 2018 – 2021</b>
<ul style="list-style-type: none"><li>Mentored students in the Spring/Summer Research Intern Program (SRIP) in computer vision research.</li></ul>		
<b>GEAR Research Mentor</b>	<b>UCSD</b>	<b>2019 – 2020</b>
<ul style="list-style-type: none"><li>Mentored students in Guided Engineering Apprenticeship in Research (GEAR) program in computer vision research.</li></ul>		
<b>ENLACE Research Mentor</b>	<b>UCSD</b>	<b>Summers 2018 &amp; 2019</b>
<ul style="list-style-type: none"><li>Mentored students in ENLACE, a high school outreach program promoting diversity in research, especially in Hispanic communities.</li></ul>		

## ACADEMIC SERVICES

- Conference Reviewer:** ICCV 2021, CVPR 2021, ECCV 2020 Workshop on Imbalance Problems in Computer Vision (IPCV).
- Volunteer & Staff Member:** CVPR 2020 Area Chair Meeting, San Diego

## TECHNICAL SKILLS

- Expertise in:** Python, PyTorch, PyTorch3D, OpenCV, Numpy, Pandas, Plotly, Jupyter Notebooks, pytest, Sphinx, Bash, Docker, Kubernetes, Vim.
- Experience with:** Java, C, HTML/CSS, JavaScript, AWS, Matlab, Amazon Turk.

## LANGUAGES

English, Cantonese.